Deaths

• Sudden deaths during marathon
  – 0.8 per 100,000
• Sudden deaths during triathlon
  – 1.5 per 100,000
  • Of 14 deaths over a 2-year period, 13 were during swimming.

Deaths

• Motor vehicle collisions are one of the leading preventable causes of death in the US.
  – 1. Smoking
  – 2. Obesity
  – 3. Alcohol
  – 4. Infectious disease
  – 5. Motor vehicle collisions
    • #1 in kids 9-18 yo

Heat Hazards

• Heatstroke (hyperthermia)
  – Characterized by high body temperature.
    • > 41ºC (105ºF)
    – Cessation of sweating
    – Headache, vomiting, fast pulse, rapid respiratory rate
    – Failure of the heat regulating mechanisms
  • Treatment:
    – Ice bath
      • Reduce core temperature below 39º C (100ºF).
    – Correct dehydration, hypoglycemia (if appropriate)

Heat Hazards

• Heat cramps
  – Painful spasms of voluntary muscles.
  – Classic hypothesis:
    • Due to dehydration, loss of sodium
    • No empirical evidence
      – No difference in electrolyte concentrations in runners developing heat cramps and those who did not (Maughan, 1986).
    – Contemporary hypothesis:
      • Alterations in neural reflex activity due to fatigue.
      – Mechanism is not clear.

Heat Hazards

• Heat exhaustion (heat syncope)
  – Acute reaction to heat exposure.
  – Collapse of athlete
  – Heavy sweating, paleness, cramps, weakness, nausea, vomiting
  – Core temperature not elevated
  • Treatment
    – Cool athlete
    – Fluids
Heat Hazards

- Exercise Associated Collapse (EAC)
  - Probably a more accurate diagnosis for the athlete collapsing at the end of an endurance race.
  - Very common for runners to feel light headed after crossing the finish line leading to collapse.
  - Symptoms usually abate upon lying down (head down position).
  - Not necessarily dehydrated (no more so than athletes who do not collapse).
  - Core temperature not elevated.

- Treatment
  - Lie down (head lower than legs).
  - Drink as needed (no IV needed).

Cold Hazards

- Hypothermia
  - Low core body temperature
  - Lean runners who are exposed to cold temperatures for longer times are at the greatest risk.
    - Walkers
    - Slow runners
  - Must wear appropriate clothing during races where effective air temperature is below 5°C (41°F, figure 4.8).

Cold Hazards

- Frostbite
  - Freezing of a body part.
  - Tissues exposed to very cold temperature at risk (effective air temperatures of -35°C or -31°F).

Summary

- Endurance performance is negatively influenced by increases in core temperature.
- Different mechanisms to maintain homeostasis.
- Fluids should be ingested.
  - Carbohydrates
  - Not necessary to replace 100% sweat lost.